

What is claimed is:

1. An injection molding method for injection molding a plate-like product that is provided with a through-hole, a depression, and the like, comprising steps of:

5 forming a cavity, which corresponds to a shape of the product without the through-hole or the depression, as a compartment between a fixed-side mold plate and a moving-side mold plate;

injecting molten resin into the cavity;

10 forming a part corresponding to the through-hole or the depression by having a punch pin project into the cavity from one of a fixed-side mold plate side and a moving-side mold plate side after the molten resin has spread out into every corner of the cavity and has stopped flowing; and

15 withdrawing the punch pin from the cavity after the molten resin that fills the cavity has hardened.

2. An injection mold assembly that is used for forming a plate-like product including a through-hole or the like according to the injection-molding method of Claim 1, comprising:

20 a fixed-side mold part;

a moving-side mold part;

a cavity that is formed as a compartment between the fixed-side mold part and the moving-side mold part when the injection mold assembly is in a closed state;

25 a punch pin that can be moved to a projecting position where the punch pin projects into the cavity and a withdrawal position where the punch pin is withdrawn from the cavity; and

a pin moving mechanism for moving the punch pin to the

projecting position and the withdrawal position.

3. An injection mold assembly according to Claim 2, wherein the pin moving mechanism includes a fluid pressure cylinder.

4. An injection mold assembly according to Claim 3, wherein the pin moving mechanism is attached to the fixed-side mold part side.

5. An injection mold assembly according to Claim 1, further comprising an eject pin for ejecting a molded product from the moving-side mold plate when the injection mold assembly is in an opened state, wherein the pin moving mechanism has only the punch pin project into the cavity when the injection mold assembly is in the closed state and has only the eject pin project into the cavity when the injection mold assembly is in the opened state.

6. An injection mold assembly according to Claim 5, wherein the pin moving mechanism includes:

a first moving plate to which the punch pin is attached;

a second moving plate to which the eject pin is attached;

a third moving plate to which a hollow knock pin for moving the first moving plate and a knock pin for moving the second moving plate are attached; and

a cylindrical guide bushing that is attached to the first moving plate and guides a front end part of the hollow knock pin,

wherein the hollow knock pin has an engaging hook part at a front end part of the hollow knock pin, the engaging hook part being capable of switching between a state where the engaging hook part is elastically displaced in a radial direction relative to the guide bushing

and engages the guide bushing and a state where the engaging hook part is released from the guide bushing,

a fixed-side attaching plate to which the fixed-side mold plate is attached is equipped with a fixed-side guide pin, and

when the injection mold assembly is in the closed state, the fixed-side guide pin is in a state where a front end part of the fixed-side guide pin has been inserted in the hollow knock pin so that the engaging hook part of the hollow knock pin does not elastically deform, while when the injection mold assembly is in the opened state, the fixed-side guide pin is in a state where the front end part of the fixed-side guide pin has been withdrawn from the hollow knock pin.

7. An injection mold assembly, comprising:

a fixed-side mold plate;

a moving-side mold plate;

a punch pin that is capable of projecting into a cavity formed between the fixed-side mold plate and the moving-side mold plate when the injection mold assembly is in a closed state;

an eject pin for ejecting a molded product from the moving-side mold plate when the injection mold assembly is in an opened state; and

a pin moving mechanism for having only the punch pin project into the cavity when the injection mold assembly is in the closed state and having only the eject pin project into the cavity when the injection mold assembly is in the opened state.

8. An injection mold assembly according to Claim 7, wherein the pin moving mechanism includes:

a first moving plate to which the punch pin is attached;

a second moving plate to which the eject pin is attached;
a third moving plate to which a hollow knock pin for moving the first moving plate and a knock pin for moving the second moving plate are attached; and

5 a cylindrical guide bushing that is attached to the first moving plate and guides an front end part of the hollow knock pin, wherein the hollow knock pin has an engaging hook part at a front end part of the hollow knock pin, the engaging hook part being capable of switching between a state where the engaging hook part is elastically displaced in a radial direction relative to the guide bushing and engages the guide bushing and a state where the engaging hook part is released from the guide bushing,

10 a fixed-side attaching plate to which the fixed-side mold plate is attached is equipped with a fixed-side guide pin, and

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when the injection mold assembly is in the closed state, the fixed-side guide pin is in a state where a front end part of the fixed-side guide pin has been inserted in the hollow knock pin so that the engaging hook part of the hollow knock pin does not elastically deform, while when the injection mold assembly is in the opened state, the fixed-side guide pin is in a state where the front end part of the fixed-side guide pin has been withdrawn from the hollow knock pin.

9. An injection mold assembly according to any of Claims 7 and 8, wherein a gate of the cavity is a disc gate, and the punch pin functions as a center pin for forming a central hole in a molded product and also as a gate pressing pin for cutting a gate part off the molded product after injection molding.